

I claim:

1. An apparatus for performing an electrochemical process on a surface of a workpiece, comprising:
 - a platen assembly comprising:
 - a support platen;
 - an electrolyte distribution plate; and
 - a first conductive layer configured to be coupled to a least a first potential;
 - a carrier configured to carry the workpiece and position the workpiece proximate the electrolyte distribution plate;
 - a reservoir for delivering an electrolyte to said electrolyte distribution plate; and
 - at least one contact separate from said platen assembly and said carrier for engaging a peripheral region of said workpiece for coupling said workpiece to a second potential.
2. An apparatus according to Claim 1 further comprising at least one opening in said platen assembly through which said at least one contact engages the workpiece.
3. An apparatus according to Claim 2 wherein said at least one opening comprises a cutout extending radially inward from an edge of said platen assembly.
4. An apparatus according to Claim 2 wherein said at least one opening comprises a hole extending through said platen assembly proximate a peripheral edge of said platen assembly.
5. An apparatus according to Claim 3 wherein said at least one contact comprises:
 - a pivot mount;
 - an arm pivotably mounted at a first end thereof to said pivot mount; and
 - a contact element for engaging said workpiece, said contact element coupled to a second end of said arm.
6. An apparatus according to Claim 5 further comprising a first motion generator

coupled to said carrier for imparting motion to said workpiece relative to said electrolyte distribution plate and wherein said contact element slidably engages said workpiece.

7. An apparatus according to Claim 6 wherein said contact element comprises a non-scratch tip.

8. An apparatus according to Claim 7 wherein said first motion generator causes said workpiece to rotate.

9. An apparatus according to Claim 8 wherein said arm is resiliently mounted so as to deflect under pressure.

10. An apparatus according to Claim 9 further comprising an adjustment mechanism for adjusting said arm.

11. An apparatus according to Claim 8 further comprising a second motion generator coupled to said platen assembly.

12. An apparatus according to Claim 11 wherein said second motion generator imparts orbital motion to said platen assembly.

13. An apparatus according to Claim 12 wherein said at least one opening is dimensioned so as to provide sufficient clearance between said contact and said platen assembly when said platen assembly is moving.

14. An apparatus according to Claim 11 wherein said second motion generator imparts rotational movement to said platen assembly.

15. An apparatus according to Claim 14 wherein said platen assembly is generally circular.

16. An apparatus according to Claim 11 wherein said second motion generator imparts reciprocating movement to said platen assembly.
17. An apparatus according to Claim 16 wherein said platen assembly is generally rectangular.
18. An apparatus according to Claim 11 further comprising an actuator coupled to said carrier for moving said workpiece vertically with respect to said platen assembly.
19. An apparatus according to Claim 1 wherein said platen assembly is generally rectangular having a width defined by first and second opposed sides.
20. An apparatus according to Claim 19 wherein said workpiece is generally circular and has a diameter greater than said width such that said workpiece overhangs said platen assembly.
21. An apparatus according to Claim 20 wherein said at least one contact engages said workpiece where said workpiece overhangs said platen assembly.
22. An apparatus according to Claim 21 further comprising a first motion generator coupled to said carrier for imparting motion to said workpiece relative to said electrolyte distribution plate and wherein said contact element slidably engages said workpiece.
23. An apparatus according to Claim 22 wherein said first motion generator causes said workpiece to rotate.
24. An apparatus according to Claim 23 further comprising a second motion generator coupled to said platen assembly.
25. An apparatus according to Claim 24 wherein said platen assembly is generally rectangular.

26. An apparatus according to Claim 25 further comprising an optical endpoint detection probe configured to monitor the workpiece.
27. An apparatus according to Claim 2 wherein said first conductive layer comprises a plurality of concentric segments, each coupled to one of a plurality of potentials.
28. An apparatus according to Claim 27 wherein at least two of said plurality of potentials are substantially the same.
29. A platen for use in an electrochemical process, the platen comprising:
a support plate;
an electrolyte distribution plate atop said support plate; and
a conductive layer beneath said distribution plate, said conductive layer comprised of a plurality of concentric conductive segments, each of said segments configured for coupling to a respective potential.
30. A platen according to Claim 29 wherein each respective potential is different.
31. An apparatus for performing an electrochemical process on a surface of a workpiece, comprising:
a platen assembly comprising:
a support platen;
an electrolyte distribution plate atop said support platen; and
a first conductive layer beneath said distribution plate and configured to be coupled to at least a first potential, said platen assembly being generally rectangular having a width defined by first and second opposite sides, said workpiece having a dimension greater than said width so that a peripheral region of said workpiece overhangs said platen assembly; and
a carrier configured to carry the workpiece and position it proximate said electrolyte distribution plate;
a reservoir for delivering an electrolyte to said electrolyte distribution plate; and

a first contact rail along at least said first side of said platen assembly for engaging said peripheral region of said workpiece for coupling said workpiece to a second potential.

32. An apparatus according to Claim 31 wherein said workpiece is generally circular and has a diameter greater than said width such that said workpiece overhangs said platen assembly.

33. An apparatus according to Claim 32 further comprising a second contact rail along at least said second side of said platen assembly for engaging said peripheral region.

34. An apparatus according to Claim 33 further comprising a first motion generator coupled to said carrier for imparting motion to said workpiece relative to said electrolyte distribution plate and wherein said contact rail slidably engages said workpiece.

35. An apparatus according to Claim 34 wherein said first motion generator causes said workpiece to rotate.

36. An apparatus according to Claim 35 further comprising a second motion generator coupled to said platen assembly.

37. An apparatus according to Claim 36 wherein said second motion generator imparts reciprocating movement to said platen assembly.

38. An apparatus according to Claim 37 further comprising an optical endpoint detection probe positioned on said first contact rail.

39. An apparatus for performing an electrochemical process on a surface of a workpiece, comprising:

a platen assembly comprising:

a support platen;

an electrolyte distribution plate; and

- a first conductive layer configured to be coupled to at least a first potential;
- a carrier configured to carry the workpiece and position the workpiece proximate the electrolyte distribution plate;
- a rigid structure for supporting the platen assembly and carrier;
- a conduit for delivering an electrolyte to said electrolyte distribution plate; and
- at least one contact mounted to the structure for engaging a peripheral region of said workpiece for coupling said workpiece to a second potential.

40. An apparatus for performing an electrochemical process on a major surface of a semiconductor wafer, comprising:

- a platen assembly comprising a support platen and an electrolyte distribution plate;
- a first conductive layer proximate said electrolyte distribution plate, configured to be coupled to at least a first potential;
- a motion generator connected to said platen assembly configured to produce a non-rotational platen motion in a plane parallel to the surface of the wafer;
- a carrier configured to hold the wafer, and to rotate the wafer about an axis perpendicular to the surface of the wafer;
- a supply of electrolyte solution; and
- at least one contact supported independently from the platen assembly and carrier, and positioned to physically engage a peripheral region of said wafer major surface, thereby coupling the wafer surface to a second potential.

41. The apparatus of claim 40 wherein the carrier non-rotational motion is of a type selected from the group comprising orbital, linear, and reciprocating motion.